

ENERGY AND CARBON DISCLOSURE · OFFICIAL · PUBLIC

What our software consumed, January to March 2026

Calendar quarter, 1 January to 31 March 2026, 90 days. Measured by Perf Sentinel 0.31.2.

Energy, operational 18.42 kWh 4 150 000 requests measured, 98.8 % of those declared	Carbon, location-based 1.91 kgCO ₂ eq a directional estimate, true value likely between 0.95 and 3.82	Avoidable with known fixes 0.34 kgCO ₂ eq 18 % of measured I/O, at the fixed canonical threshold
---	--	---

● DECLARED: SIGNED

This document carries the machine-readable report it was rendered from, as an attachment, with the signature Example SAS's pipeline placed on it in a public log. The printed code alone proves nothing: the proof is that signature, checked against the signer Example SAS publishes. Page 5 shows how, in five minutes.

document code

sha256: f4c5 754b 8808 6f30 9332 6c36 cce3 31d7 088f 3862 767e 5334 4294
6672 e05d 0923

report 00000000-0000-4000-8000-000000000002 · generated 2026-04-05T12:00:00Z

signed 2026-10-17T10:18:18Z · Rekor log index 3 293 398 030

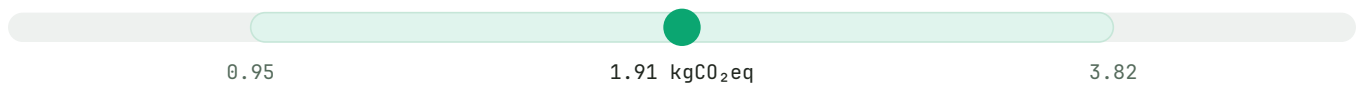
Three numbers, and how sure we are of them

Energy is measured from the work the services did. Carbon applies the carbon intensity of the electricity grid to that energy. Avoidable is what a known class of defects, repeated database and HTTP calls, wasted.

Energy, operational 18.42 kWh over 90 days, 4 150 000 requests	Carbon, location-based 1.91 kgCO ₂ eq a directional estimate, see the band below	Efficiency score 82.1 / 100 higher is better, computed by the engine
---	--	---

The carbon figure and its uncertainty

The method is a directional estimate with a ~2x bracket. The true value is likely to sit anywhere in the shaded band.



Made of operational 1.74 kg, embodied 0.17 kg.

Avoidable waste, two readings of the same data

Canonical, N+1 from 2		0.34 kg · 3.27 kWh · 18 %
Operational, N+1 from 5		0.19 kg · 1.84 kWh · 10 %

The canonical figure uses a threshold fixed in the measuring binary, so the operator cannot shrink it by tuning. The operational figure uses the operator's own threshold and is what their dashboard shows. Both are published so a reader can compare.

How much of the quarter was actually measured



Runtime coverage 91 %

164 of 180 scoring windows carried per-service energy attribution. The other 16 fell back to a proportional share of I/O operations. An official report needs at least 75 %.

Temporal coverage 96.7 %

87 of 90 days carried measured traffic, the largest gap was 2 days. Quiet days lower this figure too, so it is a floor on activity, not an uptime claim.

Where these numbers go in European climate reporting

ESRS E1 (Delegated Regulation (EU) 2023/5303), a mapping aid and not a certification. aggregate.total_energy_kwh feeds E1-5 Energy consumption and mix: Convert kWh to MWh. Not disaggregated by fossil, nuclear or renewable source.

aggregate.total_carbon_kgco2eq (operational term) feeds E1-6 Gross Scope 2 GHG emissions (location-based):

Location-based only. ESRS also requires a market-based figure, which SCI excludes. embodied carbon (SCI M term, aggregate only) feeds E1-6 Gross Scope 3 GHG emissions (categories 1 and 2): Hardware lifecycle. ESRS admits estimates and proxy data for Scope 3.

Before using these figures for ESRS E1 (Delegated Regulation (EU) 2023/5303): Interpretive crosswalk, not a certification or an audited inventory. Figures carry a 2x directional uncertainty bracket. Scope is IT compute only. It covers neither non-IT scopes nor the market-based Scope 2 figure.

Which services consumed what

Three of the four applications Example SAS declared were measured. Per-service carbon is operational only. The count of anti-patterns is published, their detail is not, by choice of granularity.

Application	Requests	Share of energy		kWh	kgCO ₂ eq	Efficiency	Anti-patterns
Checkout	2 100 000		51 %	9.40	0.98	78.0	20
Catalog	1 500 000		36.4 %	6.70	0.70	86.0	22
Billing	550 000		12.6 %	2.32	0.23	84.5	5
legacy-batch	Excluded by the operator: OTel instrumentation pending, scheduled Q2. Declared, not measured.						
Total	4 150 000			18.42	1.91	82.1	47

Scope, as declared and as measured

Declared by the operator	4 applications · 1 environment (prod) · 4 200 000 requests in the period
Derived by the engine	3 applications measured · 4 150 000 requests measured · 98.8 % coverage
Region	eu-west-3 · carbon intensity from electricity_maps

Reading the efficiency score

The score rewards services whose I/O is useful work rather than repetition. A lower score does not mean a larger footprint: a service can score higher than another while consuming less, because it carries less traffic, not because it is better written.

How the figures were produced, and what they are not

Specification	ISO/IEC 21031:2024 · conformance core-required
Measuring binary	perf-sentinel 0.31.2 · SPECpower table 2026-04-24 (CCF aligned) · energy models Cloud SPECpower table (cloud_specpower), I/O proxy, monthly x hourly grid intensity (io_proxy_v3) · binary sha256: ca12 d8b5 637a 15ef 4927 4bc3 6bad 0b59 fc42 405a a630 cc83 9f1a 5440 74cf 6cdb
Detectors enabled	n_plus_one_sql, n_plus_one_http, redundant_sql, redundant_http (core, required) · slow_sql, slow_http, excessive_fanout, chatty_service, pool_saturation, serialized_calls
Detectors disabled	none
Runtime calibration	not applied this period · 164 runtime windows, 16 fallback windows
Archive	180 scoring windows verified, hash-chained by the daemon · 0 breaks · 0 windows not archived
References	methodology github.com/Institut-du-Numerique-Responsable/perf-sentinel/blob/main/docs/METHODOLOGY.md · project github.com/Institut-du-Numerique-Responsable/perf-sentinel · schema github.com/Institut-du-Numerique-Responsable/perf-sentinel/blob/main/docs/schemas/perf-sentinel-report-v1.json

Disclaimers, exactly as the report carries them

1. Directional estimate, not regulatory-grade.
2. Approximate uncertainty bracket: ~2x multiplicative.
3. Not suitable for CSRD or GHG Protocol Scope 3 reporting.
4. Methodology: ISO/IEC 21031:2024 (SCI).
5. Per-service carbon includes operational emissions only; embodied carbon (SCI M term) is reported in the aggregate total but not attributed per service.
6. Energy and carbon attribution per service is runtime-calibrated when the window's energy_model is non-empty; archives without runtime energy attribution fall back to proportional I/O share.
7. Temporal coverage: 87/90 declared days carried measured traffic (96.7%, largest gap 2 days). Archiving is traffic-gated, so days without measured traffic, including legitimately quiet periods, lower this figure. It is a lower bound on activity, not a daemon-uptime guarantee.

What this document is

A public transparency report produced by an open-source tool, published by Example SAS on its own responsibility. It is not an audited inventory and does not make a CSRD submission. The scope is IT compute observed through application traces: no end-user devices, no buildings.

Five minutes to know it was not altered

The check is on the report attached inside this PDF, not on its layout.

Claim	Checked by
The figures match document code sha256: f4c5 754b 8808 6f30 9332 6c36 cce3 31d7 088f 3862 767e 5334 4294 6672 e05d 0923	perf-sentinel when this PDF was rendered, and you
The signed attestation names that same code	perf-sentinel when this PDF was rendered, and you
Example SAS's pipeline signed it, in the public Sigstore log	you, with the command below
The measuring binary is an official Perf Sentinel release	you, with the command below
An auditor reviewed the figures	nobody, this report is not audited

Attached to this PDF

☐ report.json · source	9 KB
sha256 2ce825c7952cfc2796961f18127183b85559c855c9ed357267f39109fcf6e388	
☐ attestation.intoto.jsonl · supplement, names the document code	1 KB
sha256 3079f9ce42d15d12c6ce0076dcf5c388262cf69e6248e02dc929ed7768ccfc56d	
☐ bundle.sig · supplement, Sigstore bundle	12 KB
sha256 a6f67886b49b7fe5b53707c27e3fa8b25095bc81d17d90c09a3853e8c2e1d152	

If you do not run commands

- 1 Ask Example SAS for the page where it publishes its reports. It should list the document code of each report.
- 2 Compare that code with the document code printed in full on page 1 and in the table above, every group. A different code means a different report. A matching code is only as good as the page you compared it with.
- 3 For proof, hand this PDF to anyone with a terminal. The steps below need free tools and no account.

If you do

```
perf-sentinel verify-hash --report report.pdf \
  --verify-binary <perf-sentinel-binary> \
  --expected-issuer https://token.actions.githubusercontent.com \
  --expected-identity \
    'https://github.com/Institut-du-Numerique-Responsable/perf-sentinel/.github/workflows/sample-disclosure.yml@refs/heads/main'
# TRUSTED    code, signature and binary all check out
# UNTRUSTED  something was altered, or the signer is not Example SAS's
```

It reads the attachments out of the PDF itself. TRUSTED needs cosign and gh on the PATH, perf-sentinel alone stops at PARTIAL.

What a tampered copy looks like

A changed figure in the attached report changes the document code, so it fails step 2. A forger who prints the new code instead fails the command: the signed attestation names the original code, and the signature sits in a public, append-only log that neither Example SAS nor the forger can edit. The code covers the attached report.json only: a PDF editor can change the printed figures without changing it, so compare the figures with the attached report.

Every field of the report, as it carries it

Each field the perf-sentinel-report/v1.7 schema defines, in the order it defines them, as the attached report.json carries it. A report written against an earlier version lacks the fields added since. "not reported" means the report does not carry the field, or carries it empty. This annex prints the attached report and checks nothing: the proof is still that report, checked as the verify page shows.

schema_version

schema_version	perf-sentinel-report/v1.7
----------------	---------------------------

report_metadata

report_metadata.intent	official
report_metadata.confidentiality_level	public
report_metadata.integrity_level	signed
report_metadata.generated_at	2026-04-05T12:00:00Z
report_metadata.generated_by	daemon
report_metadata.perf_sentinel_version	0.31.2
report_metadata.report_uuid	00000000-0000-4000-8000-000000000002
report_metadata.binary_version	0.31.2

organisation

organisation.name	Example SAS
organisation.country	FR
organisation.identifiers.siren	123456789
organisation.identifiers.vat	FR12123456789
organisation.identifiers.lei	not reported
organisation.identifiers.opencorporates_url	not reported
organisation.identifiers.domain	example.fr
organisation.sector	62.01

period

period.from_date	2026-01-01
period.to_date	2026-03-31
period.period_type	calendar-quarter
period.days_covered	90

scope_manifest

scope_manifest.total_applications_declared	4
scope_manifest.applications_measured	3
scope_manifest.applications_excluded[0].service_name	legacy-batch
scope_manifest.applications_excluded[0].reason	OTel instrumentation pending, scheduled Q2
scope_manifest.environments_measured[0]	prod
scope_manifest.environments_excluded[].name	not reported
scope_manifest.environments_excluded[].reason	not reported
scope_manifest.total_requests_in_period	4200000
scope_manifest.requests_measured	4150000
scope_manifest.coverage_percentage	98.8
scope_manifest.coverage_basis.operator_declared[0]	total_applications_declared
scope_manifest.coverage_basis.operator_declared[1]	total_requests_in_period
scope_manifest.coverage_basis.operator_declared[2]	applications_excluded
scope_manifest.coverage_basis.operator_declared[3]	environments_measured
scope_manifest.coverage_basis.operator_declared[4]	environments_excluded
scope_manifest.coverage_basis.machine_derived[0]	applications_measured
scope_manifest.coverage_basis.machine_derived[1]	requests_measured
scope_manifest.coverage_basis.machine_derived[2]	coverage_percentage

methodology

methodology.sci_specification	ISO/IEC 21031:2024
-------------------------------	--------------------

methodology.perf_sentinel_version	0.31.2
methodology.enabled_patterns[0]	n_plus_one_sql
methodology.enabled_patterns[1]	n_plus_one_http
methodology.enabled_patterns[2]	redundant_sql
methodology.enabled_patterns[3]	redundant_http
methodology.enabled_patterns[4]	slow_sql
methodology.enabled_patterns[5]	slow_http
methodology.enabled_patterns[6]	excessive_fanout
methodology.enabled_patterns[7]	chatty_service
methodology.enabled_patterns[8]	pool_saturation
methodology.enabled_patterns[9]	serialized_calls
methodology.disabled_patterns[].name	not reported
methodology.disabled_patterns[].reason	not reported
methodology.core_patterns_required[0]	n_plus_one_sql
methodology.core_patterns_required[1]	n_plus_one_http
methodology.core_patterns_required[2]	redundant_sql
methodology.core_patterns_required[3]	redundant_http
methodology.conformance	core-required
methodology.calibration_inputs.cloud_regions[0]	eu-west-3
methodology.calibration_inputs.carbon_intensity_source	electricity_maps
methodology.calibration_inputs.specpower_table_version	2026-04-24
methodology.calibration_inputs.binary_specpower_vintage	2026-04-24 (CCF aligned)
methodology.calibration_inputs.scaphandre_used	false
methodology.calibration_inputs.energy_source_models[0]	cloud_specpower
methodology.calibration_inputs.energy_source_models[1]	io_proxy_v3
methodology.calibration_inputs.calibration_applied	false
methodology.calibration_inputs.scoring_coefficients[0]	embodied_gco2_per_request=0.04
methodology.calibration_inputs.scoring_coefficients[1]	per_operation_coefficients=true
methodology.calibration_inputs.scoring_coefficients[2]	use_hourly_profiles=true
methodology.calibration_inputs.carbon_methodologies[0]	sci_v1_numerator
methodology.calibration_inputs.embodied_gco2_total	166.0
methodology.calibration_inputs.embodied_gco2_per_request	0.04
methodology.standard_crosswalk.standard	ESRS E1 (Delegated Regulation (EU) 2023/5303)
methodology.standard_crosswalk.mappings[0].report_field	aggregate.total_energy_kwh
methodology.standard_crosswalk.mappings[0].datapoint	E1-5 Energy consumption and mix
methodology.standard_crosswalk.mappings[0].note	Convert kWh to MWh. Not disaggregated by fossil, nuclear or renewable source.
methodology.standard_crosswalk.mappings[1].report_field	aggregate.total_carbon_kgco2eq (operational term)
methodology.standard_crosswalk.mappings[1].datapoint	E1-6 Gross Scope 2 GHG emissions (location-based)
methodology.standard_crosswalk.mappings[1].note	Location-based only. ESRS also requires a market-based figure, which SCI excludes.
methodology.standard_crosswalk.mappings[2].report_field	embodied carbon (SCI M term, aggregate only)
methodology.standard_crosswalk.mappings[2].datapoint	E1-6 Gross Scope 3 GHG emissions (categories 1 and 2)
methodology.standard_crosswalk.mappings[2].note	Hardware lifecycle. ESRS admits estimates and proxy data for Scope 3.
methodology.standard_crosswalk.caveats[0]	Interpretive crosswalk, not a certification or an audited inventory.
methodology.standard_crosswalk.caveats[1]	Figures carry a 2x directional uncertainty bracket.
methodology.standard_crosswalk.caveats[2]	Scope is IT compute only. It covers neither non-IT scopes nor the market-based Scope 2 figure.

aggregate

aggregate.total_requests	4150000
aggregate.total_energy_kwh	18.42
aggregate.total_carbon_kgco2eq	1.91
aggregate.carbon_breakdown.operational_kgco2eq	1.744
aggregate.carbon_breakdown.embodied_kgco2eq	0.166
aggregate.carbon_breakdown.database_kgco2eq_out_of_total	not reported
aggregate.carbon_breakdown.messaging_kgco2eq_out_of_total	not reported
aggregate.carbon_breakdown.transport_kgco2eq	not reported
aggregate.carbon_breakdown.transport_kgco2eq_low	not reported
aggregate.carbon_breakdown.transport_kgco2eq_high	not reported
aggregate.aggregate_efficiency_score	82.1

aggregate.aggregate_waste_ratio	0.18
aggregate.anti_patterns_detected_count	47
aggregate.estimated_optimization_potential_kgco2eq	0.34
aggregate.canonical_waste.n_plus_one_threshold	2
aggregate.canonical_waste.energy_kwh	3.27
aggregate.canonical_waste.carbon_kgco2eq	0.34
aggregate.canonical_waste.waste_ratio	0.18
aggregate.canonical_waste.efficiency_score	82.1
aggregate.operational_waste.n_plus_one_threshold	5
aggregate.operational_waste.energy_kwh	1.84
aggregate.operational_waste.carbon_kgco2eq	0.19
aggregate.operational_waste.waste_ratio	0.1
aggregate.operational_waste.efficiency_score	90.0
aggregate.period_coverage	0.91
aggregate.binary_versions[0]	0.31.2
aggregate.runtime_windows_count	164
aggregate.fallback_windows_count	16
aggregate.database_waste.energy_kwh	not reported
aggregate.database_waste.measured_energy_kwh	not reported
aggregate.database_waste.declared_energy_kwh	not reported
aggregate.database_waste.models	not reported
aggregate.database_waste.windows_with_figure	not reported
aggregate.database_waste.measured_windows	not reported
aggregate.database_waste.declared_windows	not reported
aggregate.database_waste.estimated_windows	not reported
aggregate.database_waste.windows_with_carbon	not reported
aggregate.database_waste.operational_waste_kwh	not reported
aggregate.database_waste.operational_waste_kgco2eq	not reported
aggregate.database_waste.canonical_waste_kwh	not reported
aggregate.database_waste.canonical_waste_kgco2eq	not reported
aggregate.messaging_waste.energy_kwh	not reported
aggregate.messaging_waste.measured_energy_kwh	not reported
aggregate.messaging_waste.declared_energy_kwh	not reported
aggregate.messaging_waste.models	not reported
aggregate.messaging_waste.windows_with_figure	not reported
aggregate.messaging_waste.measured_windows	not reported
aggregate.messaging_waste.declared_windows	not reported
aggregate.messaging_waste.estimated_windows	not reported
aggregate.messaging_waste.windows_with_carbon	not reported
aggregate.messaging_waste.operational_waste_kwh	not reported
aggregate.messaging_waste.operational_waste_kgco2eq	not reported
aggregate.messaging_waste.canonical_waste_kwh	not reported
aggregate.messaging_waste.canonical_waste_kgco2eq	not reported
aggregate.per_service_energy_models.billing[0]	io_proxy_v3
aggregate.per_service_energy_models.catalog[0]	cloud_specpower
aggregate.per_service_energy_models.checkout[0]	cloud_specpower
aggregate.per_service_measured_ratio.billing	0.0
aggregate.per_service_measured_ratio.catalog	1.0
aggregate.per_service_measured_ratio.checkout	1.0
aggregate.temporal_coverage.temporal_coverage	0.967
aggregate.temporal_coverage.observed_days	87
aggregate.temporal_coverage.days_in_period	90
aggregate.temporal_coverage.largest_gap_days	2

applications

applications[0].service_name	checkout
applications[0].display_name	Checkout
applications[0].service_version	not reported
applications[0].endpoints_observed	14
applications[0].total_requests	2100000
applications[0].energy_kwh	9.4
applications[0].carbon_kgco2eq	0.98

applications[0].efficiency_score	78.0
applications[0].anti_patterns[].type	not reported
applications[0].anti_patterns[].occurrences	not reported
applications[0].anti_patterns[].estimated_waste_kwh	not reported
applications[0].anti_patterns[].estimated_waste_kgco2eq	not reported
applications[0].anti_patterns[].first_seen	not reported
applications[0].anti_patterns[].last_seen	not reported
applications[0].anti_patterns[].rgesn_criteria	not reported
applications[0].anti_patterns_detected_count	20
applications[1].service_name	catalog
applications[1].display_name	Catalog
applications[1].service_version	not reported
applications[1].endpoints_observed	9
applications[1].total_requests	1500000
applications[1].energy_kwh	6.7
applications[1].carbon_kgco2eq	0.7
applications[1].efficiency_score	86.0
applications[1].anti_patterns[].type	not reported
applications[1].anti_patterns[].occurrences	not reported
applications[1].anti_patterns[].estimated_waste_kwh	not reported
applications[1].anti_patterns[].estimated_waste_kgco2eq	not reported
applications[1].anti_patterns[].first_seen	not reported
applications[1].anti_patterns[].last_seen	not reported
applications[1].anti_patterns[].rgesn_criteria	not reported
applications[1].anti_patterns_detected_count	22
applications[2].service_name	billing
applications[2].display_name	Billing
applications[2].service_version	not reported
applications[2].endpoints_observed	6
applications[2].total_requests	550000
applications[2].energy_kwh	2.32
applications[2].carbon_kgco2eq	0.23
applications[2].efficiency_score	84.5
applications[2].anti_patterns[].type	not reported
applications[2].anti_patterns[].occurrences	not reported
applications[2].anti_patterns[].estimated_waste_kwh	not reported
applications[2].anti_patterns[].estimated_waste_kgco2eq	not reported
applications[2].anti_patterns[].first_seen	not reported
applications[2].anti_patterns[].last_seen	not reported
applications[2].anti_patterns[].rgesn_criteria	not reported
applications[2].anti_patterns_detected_count	5

integrity

integrity.content_hash	sha256:f4c5754b88086f3093326c36cce331d7088f3862767e533442946672e05d0923
integrity.binary_hash	sha256:ca12d8b5637a15ef49274bc36bad0b59fc42405aa630cc839f1a544074cf6cdb
integrity.binary_verification_url	https://github.com/Institut-du-Numerique-Responsable/perf-sentinel/releases/tag/v0.31.2
integrity.trace_integrity_chain.windows_verified	180
integrity.trace_integrity_chain.windows_unchained	0
integrity.trace_integrity_chain.breaks	0
integrity.trace_integrity_chain.breaks_outside_period	0
integrity.trace_integrity_chain.windows_dropped	0
integrity.trace_integrity_chain.drop_counter_resets	0
integrity.signature.format	sigstore-cosign-intoto-v1
integrity.signature.bundle_url	https://perf-sentinel.dev/exemple/disclosure/bundle.sig
integrity.signature.signer_identity	https://github.com/Institut-du-Numerique-Responsable/perf-sentinel/.github/workflows/sample-disclosure.yml@refs/heads/main
integrity.signature.signer_issuer	https://token.actions.githubusercontent.com
integrity.signature.rekor_url	https://rekor.sigstore.dev
integrity.signature.rekor_log_index	3293398030

integrity.signature.signed_at	2026-10-17T10:18:18Z
integrity.binary_attestation.format	not reported
integrity.binary_attestation.attestation_url	not reported
integrity.binary_attestation.builder_id	not reported
integrity.binary_attestation.git_tag	not reported
integrity.binary_attestation.git_commit	not reported
integrity.binary_attestation.slsa_level	not reported
integrity.cross_period_log.format	not reported
integrity.cross_period_log.log_url	not reported
integrity.cross_period_log.previous_report_hash	not reported
notes	
notes.disclaimers[0]	Directional estimate, not regulatory-grade.
notes.disclaimers[1]	Approximate uncertainty bracket: ~2x multiplicative.
notes.disclaimers[2]	Not suitable for CSRD or GHG Protocol Scope 3 reporting.
notes.disclaimers[3]	Methodology: ISO/IEC 21031:2024 (SCI).
notes.disclaimers[4]	Per-service carbon includes operational emissions only; embodied carbon (SCI M term) is reported in the aggregate total but not attributed per service.
notes.disclaimers[5]	Energy and carbon attribution per service is runtime-calibrated when the window's energy_model is non-empty; archives without runtime energy attribution fall back to proportional I/O share.
notes.disclaimers[6]	Temporal coverage: 87/90 declared days carried measured traffic (96.7%, largest gap 2 days). Archiving is traffic-gated, so days without measured traffic, including legitimately quiet periods, lower this figure. It is a lower bound on activity, not a daemon-uptime guarantee.
notes.reference_urls.methodology	https://github.com/Institut-du-Numerique-Responsable/perf-sentinel/blob/main/docs/METHODOLOGY.md
notes.reference_urls.project	https://github.com/Institut-du-Numerique-Responsable/perf-sentinel
notes.reference_urls.schema	https://github.com/Institut-du-Numerique-Responsable/perf-sentinel/blob/main/docs/schemas/perf-sentinel-report-v1.json